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Caltrans Division of Research, Innovation and System Information

Research Results

Estimating Bicycle and Pedestrian Activity

Promoting non-motorized travel is hampered by a lack of data and understanding the factors that influence it

Planning/ Policy/ System Information

DECEMBER 2014

Project Title:
Non-Motorized Travel: Analysis of the 2009 NHTS California Travel Survey Add-On Data

Task Number: 2200

Start Date: August 1, 2011

Completion Date: December 31, 2013

Product Category: New decision support tool, simulation, model, or algorithm; processed data/database

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WHAT WAS THE NEED?

Walking and bicycling as modes of transportation, referred to as non-motorized transportation or active travel, offer personal health, economic, environmental, and equity benefits. Yet these modes represent a small share of all travel in the United States—less than 10% of all trips based on data from 2008. In comparison, other developed countries, as well as some cities in the United States, have significantly higher levels of walking and bicycling, suggesting that policy changes could increase the use of non-motorized travel.

Infrastructure decisions and investments are influenced by assessed usage and need. However, detailed estimates of bicycle and pedestrian activity are not available. The National Household Travel Survey (NHTS) is the main source of bicycle and pedestrian data, but it does not fully cover the state nor represent all geographies. It is important to know how much cyclists and pedestrians are using roadways to inform where investments in bicycle and pedestrian infrastructure are needed and to identify potentially dangerous locations to improve safety.

WHAT WAS THE GOAL?

The goal was to improve the quantitative understanding of non-motorized travel and the factors that influence it to better address the needs of pedestrians and bicyclists.

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Caltrans provides a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

WHAT DID WE DO?

Caltrans, in partnership with the University of California, Davis Sustainable Transportation Research Center, analyzed the results from the 2009 NHTS, focusing on the California Add-On survey that Caltrans funded regarding non-motorized travel. The data represents 18,000 residents in all 58 counties, with descriptive results showing who is walking and bicycling, how much, and for what purposes. Modeling results identified key factors associated with active travel, including environmental and individual characteristics.

This research estimated cyclist and pedestrian activity based on a combination of travel survey, census, land use, safety, and collision data. A spatial database for the state captures key features of the built environment using various data sources to incorporate population density, access to jobs, and street connectivity. This task included basic descriptive analysis of neighborhood characteristics associated with higher levels of pedestrian and bicycle activity.

WHAT WAS THE OUTCOME?

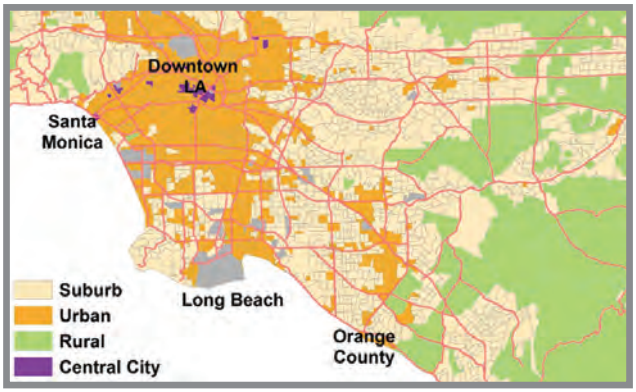
The research developed a new method of estimating pedestrian and cyclist activity levels at a more granular geographic scale. Econometric techniques were used to examine the effect of individual and environmental characteristics on non-motorized behavior. This data provides a better understanding of non-motorized travel behavior throughout the state.

WHAT IS THE BENEFIT?

Understanding the patterns of biking and walking and the factors that influence individuals is critical for creating effective policies to promote non-motorized travel. Having more robust data provides information on which roads are most heavily used by cyclists and pedestrians and helps prioritize infrastructure needs and investments. The results will contribute to the development of regional transportation plans and local bicycle and pedestrian plans and encourage the growth of non-motorized travel.

LEARN MORE

To view the complete report:
www.dot.ca.gov/hq/tpp/offices/ocp/ATLC/documents/9_Estimating_Total_Miles_Walked_and_Biked-Handy.pdf



The study classified areas into neighborhood types based on density and the characteristics of the built environment.

Results by Neighborhood Type Based on National and California Travel Surveys

Neighborhood Type	Mean Miles Walked per Road Mile		Mean Miles Biked per Road Mile	
	NHTS*	CHTS**	NHTS	CHTS
Central City	922	1,412	115	379
Urban	224	246	85	115
Suburb	92	65	33	47
Rural	34	22	14	13
	Mean Annual Accidents per Million Miles Walked on a Weekday		Mean Annual Accidents per Million Miles Biked on a Weekday	
	NHTS	CHTS	NHTS	CHTS
Central City	98	64	2,627	794
Urban	122	112	1,033	767
Suburb	133	189	837	582
Rural	199	327	899	899

* 2009 National Household Travel Survey
** 2010–12 California Household Travel Survey